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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,893	06/19/2003	Mahadev Somasundaram	CISCP340/258344	6796
22434 7590 06/08/2009 Weaver Austin Villeneuve & Sampson LLP P.O. BOX 70250 OAKLAND, CA 94612-0250				
EXAMINER				
WONG, BLANCHE				
ART UNIT		PAPER NUMBER		
2419				
MAIL DATE		DELIVERY MODE		
06/08/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/600,893

Applicant(s)

SOMASUNDARAM, MAHADEV

Examiner

Blanche Wong

Art Unit

2419

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-16 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-16 and 18-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date May 29 2009
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-8,10,11 and 14-24 have been considered but are moot in view of the new ground(s) of rejection.
2. The allowability of claims 12 and 13 have been withdrawn. New claims 25 and 26 corresponding to claims 12 and 13 are rejected accordingly.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. **Claims 12,13,18-20,25,26** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 12, it is unclear what is the operational connection between the step of "performing NAT on the packet using the entry in the translation table" in lines 21-22 which is within the step of "performing NAT on the packet" in lines 8 and 15-16, and the steps of "identifying one of the plurality of routing tables to route the packet using the information in indicating one of the plurality of routing tables to route the packet; identifying an entry in the identified one of the plurality of routing tables using the IP destination address; and routing the packet using the identified routing table entry" in lines 9-13. That is, how is the NAT using the entry in the translation table differ

from an entry in the identified one of the plurality of routing tables using the IP destination address, and whether the routing the packet using the identified routing table entry, also uses the entry in the translation table. Similarly in claim 25.

Claims 13 and 26 are rejected because they are dependent from rejected claims 12 and 25.

With regard to claim 18, it is unclear how updating the plurality of sets of routing information comprises updating a single routing table. Is the plurality of sets of routing information all within the one routing table?

Claims 19 and 20 are rejected because they are dependent from rejected claim 18.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-8,10,11,14-16,18-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuhira (EP 1 298 853) (provided by Applicant) in view of Knee et

al. (US 2002/0143787) and Badran ("Service Provider Networking Infrastructures with MPLS") (provided by Applicant).

With regard to claims 1 and 22-24, Matushira discloses
maintaining a plurality of routing tables (**routing tables 501,502,503 in Fig. 8**),
each of a plurality of virtual private networks being associated with a different one of the
plurality of routing tables (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8**)
VPNs with IDs 1 and 2 have its own routing table);

receiving a packet (**routing function 30 in Fig. 8**), the packet including an IP
source address and an IP destination address (**source address 26 and destination
address 27 in Fig. 2 or 28 and 29 respectively in Fig. 3**), the packet further including
information indicating one of the plurality of routing tables to route the packet (**label
field in Fig. 5**);

performing Network Address Translation on the packet (**VPN to IP in Fig. 7**); and
identifying one of the plurality of routing tables to route the packet using the
information indicating one of the plurality of routing tables to route the packet (**See VPN
ID 1 and 2 in accommodating function 32 Fig. 8**) (**VPNs with IDs 1 and 2 have its
own routing table**).

However, Matushira fails to explicitly show

identifying an entry in the identified one of the plurality of routing tables using the
IP destination address;

routing the packet using the identified routing table entry;

receiving a default route to a network device providing one or more shared services, the default route to the network device providing one or more shared services being advertised by the network device providing one or more shared services, wherein each of the shared services is available to each of the plurality of virtual private networks; and

updating each of the plurality of routing tables to include the default route, thereby enabling the plurality of virtual private networks to access the shared services via the default route that is included in each of the plurality of routing tables.

In an analogous art of routing tables, Knee discloses

identifying an entry in the identified one of the plurality of routing tables using the IP destination address ("an IP destination address matches ... one entry in the routing table", para. [0007]); and

routing the packet using the identified routing table entry ("... forward the packet according to the forwarding instructions associated with the entry having the most 'specific' matching routing table entry ...", para. [0007]).

In an analogous art of tag switching, Badran discloses

receiving a default route (**FIB table**) to a network device providing one or more shared services, the default route to the network device providing one or more shared services being advertised (**distribution**) by the network device providing one or more

shared services (**"BGP is a routing information distribution protocol that defines who can talk to whom using multi-protocol extensions and community attributes. VPN membership depends upon logical ports entering the VPN, where BPG assigns a unique RD. RDs are unknown to end users, making it impossible to enter the network on another access port and spoof a flow. Only pre-assigned ports are allowed to participate in the VPN. In an MPLS-enabled VPN, BGP distributes forwarding information base (FIB) tables about VPNs to only members of the same VPN, providing native security via logical VPN traffic separation"**, p.317, Section 3.3), wherein each of the shared services is available to each of the plurality of virtual private networks (**"Using MPLS, service providers can deliver the IP VPN services that business demand across either switched or routed networks"**, p.312, Abstract); and

updating (**updating**) each of the plurality of routing tables to include the default route, thereby enabling the plurality of virtual private networks to access the shared services via the default route that is included in each of the plurality of routing tables (**"BGP maps FIB tables to provider edge LSRs belonging to only a particular VPN, instead of updating all edge LSRs in the provider network"**, p.316, Section 3.3).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Knee, with Matushira, for the benefit of address lookup efficiency. Knee, para. [0003]. It would have been obvious to a person of ordinary skill in the art to combine the teaching of Badran, with Matushira and Knee,

to take advantage of MPLS including Traffic Engineering and Quality of Service mechanisms. Badran, Abstract.

With regard to claim 2, Matsuhira further discloses each of the plurality of virtual private networks is associated with a different customer (**organization A,B,C, para. [0004]**) (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8**).

With regard to claim 3, Matsuhira further discloses the network device is associated with an ingress interface of a service provider network (**VPN edge router 20 in Fig. 8**).

With regard to claim 4, Matsuhira further discloses the network device is associated with an egress interface of a service provider network (**VPN edge router 20 in Fig. 8**).

With regard to claim 5, Matsuhira further discloses the network device is associated with a service provider network (**service providers, para. [0004]**).

With regard to claim 6, Matsuhira further discloses translating the IP source address from a private address to a public address when the packet is received from a network device in a private network ("**... in the direction from Intranet to Internet,**

any packet for communication in an Intranet is converted to a packet which can be processed in the Internet.", para. [0006])(See Also Fig. 7).

With regard to claim 7, Matsuhira further discloses translating the IP destination address from a public address to a private address when the packet is received from a network device in a public network ("**... in the direction from Intranet to Internet, any packet for communication in an Intranet is converted to a packet which can be processed in the Internet.**", para. [0006])(See Also Fig. 7).

With regard to claim 8, Matsuhira further discloses the network device in the public network provides one or more services to each of the plurality of virtual private networks (**service providers, para. [0004]**).

With regard to claim 10, the combination of Matsuhira, Knee and Badran discloses the method as recited in claim 1. Matsuhira further discloses identifying the one of the plurality of routing tables associated with the ascertained virtual private network (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8**).

Badran further discloses the packet includes an MPLS tag indicating a virtual private network ("**Using MPLS, service providers can deliver the IP VPN services that business demand across either switched or routed networks**", p.312, **Abstract**), and wherein identifying one of the plurality of routing tables comprises:

ascertaining the virtual private network from the MPLS tag ("**to enable the delivery of VPN services**", p.312, Abstract).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Knee, with Matushira, for the benefit of address lookup efficiency. Knee, para. [0003]. It would have been obvious to a person of ordinary skill in the art to combine the teaching of Badran, with Matushira and Knee, to take advantage of MPLS including Traffic Engineering and Quality of Service mechanisms. Badran, Abstract.

With regard to claim 11, the combination of Matushira, Knee and Badran discloses the method as recited in claim 10.

Badran further discloses the MPLS tag further identifies the network device responsible for performing NAT and routing the packet ("**MPLS ... Labels indicate both routes and service attributes**", p.312, Abstract).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Badran, with Matushira and Knee, for the advantages of MPLS including Traffic Engineering and Quality of Service mechanisms. Badran, Abstract.

With regard to claim 14, Matushira discloses maintaining a plurality of routing tables (**routing tables 501,502,503 in Fig. 8**), each of a plurality of virtual private networks being associated with a different one of the

plurality of routing tables (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8)**
VPNs with IDs 1 and 2 have its own routing table);

receiving a packet (**routing function 30 in Fig. 8**), the packet including an IP source address and an IP destination address (**source address 26 and destination address 27 in Fig. 2 or 28 and 29 respectively in Fig. 3**), the packet further including information indicating one of the plurality of routing tables to route the packet (**label field in Fig. 5**);

performing Network Address Translation on the packet (**VPN to IP in Fig. 7**); and
identifying one of the plurality of routing tables to route the packet using the information indicating one of the plurality of routing tables to route the packet (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8**) (**VPNs with IDs 1 and 2 have its own routing table**).

However, Matushira fails to explicitly show

identifying an entry in one of the plurality of routing information using the IP destination address and the information indicating one of the plurality of sets of routing information ;

routing the packet using the identified entry;

receiving a default route to a network device providing one or more shared services, the default route to the network device providing one or more shared services being advertised by the network device providing one or more shared services, wherein

each of the shared services is available to each of the plurality of virtual private networks; and

updating each of the plurality of routing information to include the default route, wherein each of the plurality of sets of routing information corresponding to each of the plurality of virtual private networks is stored in one or more routing tables, thereby updating the one or more routing tables associated with the plurality of virtual private networks to include the default route to the network device providing one or more shared service available to each of the plurality of virtual private networks, enabling the plurality of virtual private networks to access the shared services via the default route that is included in each of the plurality of routing tables.

In an analogous art of routing tables, Knee discloses identifying an entry in the identified one of the plurality of routing information using the IP destination address ("**an IP destination address matches ... one entry in the routing table**", para. [0007]); and

routing the packet using the identified routing table entry ("**... forward the packet according to the forwarding instructions associated with the entry having the most 'specific' matching routing table entry ...**", para. [0007]).

In an analogous art of tag switching, Badran discloses receiving a default route (**FIB table**) to a network device providing one or more shared services, the default route to the network device providing one or more shared

services being advertised (**distribution**) by the network device providing one or more shared services (**"BGP is a routing information distribution protocol that defines who can talk to whom using multi-protocol extensions and community attributes. VPN membership depends upon logical ports entering the VPN, where BGP assigns a unique RD. RDs are unknown to end users, making it impossible to enter the network on another access port and spoof a flow. Only pre-assigned ports are allowed to participate in the VPN. In an MPLS-enabled VPN, BGP distributes forwarding information base (FIB) tables about VPNs to only members of the same VPN, providing native security via logical VPN traffic separation", p.317, Section 3.3**), wherein each of the shared services is available to each of the plurality of virtual private networks (**"Using MPLS, service providers can deliver the IP VPN services that business demand across either switched or routed networks", p.312, Abstract**); and

updating (**updating all edge LSRs**) each of the plurality of routing tables to include the default route, thereby updating the one or more routing tables associated with the plurality of virtual private networks (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8**) (**VPNs with IDs 1 and 2 have its own routing table**) to include the default route to the network device providing one or more shared service available to each of the plurality of virtual private networks, enabling the plurality of virtual private networks to access the shared services via the default route that is included in each of the plurality of routing tables (**"BGP maps FIB tables to provider edge LSRs**

belonging to only a particular VPN, instead of updating all edge LSRs in the provider network”, p.316, Section 3.3).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Knee, with Matushira, for the benefit of address lookup efficiency. Knee, para. [0003]. It would have been obvious to a person of ordinary skill in the art to combine the teaching of Badran, with Matushira and Knee, to add security. Badran, p.316, 3.3. MPLS VPN Security.

With regard to claim 15, Matushira further discloses each of the plurality of sets of routing information corresponding to each of the plurality of virtual private networks is stored in a separate routing table **(See VPN ID 1 and 2 in accommodating function 32 Fig. 8) (VPNs with IDs 1 and 2 have its own routing table).**

With regard to claim 16, Matushira further discloses each of the plurality of sets of routing information corresponding to each of the plurality of virtual private networks is stored in a single routing table **(See VPN ID 1 and 2 in accommodating function 32 Fig. 8) (VPNs with IDs 1 and 2 have its own routing table)**, wherein each entry in the routing table includes a VPN identifier identifying the corresponding one of the plurality of virtual private networks **(VPN ID 1 and 2).**

With regard to claim 18, Matushira further discloses updating (**updating**) a single routing table to include default route (**“BGP maps FIB tables to provider edge LSRs belonging to only a particular VPN, instead of updating all edge LSRs in the provider network”, p.316, Section 3.3**).

With regard to claim 19, Matushira further discloses the single routing table is dedicated to storing the default route (**FIB**) to shared services available to each of the plurality of virtual private networks (**“BGP maps FIB tables to provider edge LSRs belonging to only a particular VPN, instead of updating all edge LSRs in the provider network”, p.316, Section 3.3**).

With regard to claim 20, Matushira further discloses the single routing table stores the plurality of sets of routing information (**a table has more than one entry**).

With regard to claim 21, Matushira further discloses updating (**updating**) a plurality of sets of routing tables to include the default route (**FIB**), each of the plurality of routing tables being associated with a different one of the plurality of virtual private networks (**See VPN ID 1 and 2 in accommodating function 32 Fig. 8**) (**VPNs with IDs 1 and 2 have its own routing table**).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blanche Wong whose telephone number is 571-272-

Art Unit: 2419

3177. The examiner can normally be reached on Monday through Friday, 830am to 530pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz Sheikh can be reached on 571-272-3795. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Blanche Wong/
Examiner, Art Unit 2419
June 3, 2009

/Ayaz R. Sheikh/
Supervisory Patent Examiner, Art Unit 2419